Claims

1. A cancellation system for echo or crosstalk noise in a communications transceiver for a plurality of channels, the system comprising a channel circuit comprising taps for each channel and means for training the taps by setting coefficient values, characterised in that:-

at least some of the channel circuits (11(a) – 11(d)) each comprise insufficient taps for a full span;

each of said channel circuits further comprises a variable delay line (vdl) connected in series with the taps;

the training means comprises means for setting length of each variable delay line so that positions of the taps are optimised.

2. A cancellation system as claimed in claim 1, wherein the training means comprises means for sharing taps from another channel circuit when training each channel circuit in order to achieve a full span for each channel during training.

3. A cancellation system as claimed in claim 1, wherein each channel circuit comprises a plurality of variable delay lines (n_vdl, f_vdl) separated by taps.

4. A cancellation system as claimed in claim 1, wherein the taps are arranged in at least one block (f_echo) having a fixed number of taps.

5.   A canceller as claimed in claim 4, wherein the training means comprises means for determining an optimum position for each tap block to set the length of the variable delay line.

5   6.   A cancellation system as claimed in claim 5, wherein the training means comprises means for determining a coefficient sum for each of a plurality of candidate windows, and choosing the window providing the maximum coefficient sum.

10   7.   A cancellation system as claimed in claim 5, wherein the training means comprises means for determining an optimum position for each block subject to pre-set constraints.

8.   A cancellation system as claimed in claim 7, wherein a constraint is a

15   maximum length for the variable delay line.

9.   A cancellation system as claimed in claim 7, wherein a constraint is that tap blocks do not overlap.

20   10.   A cancellation system as claimed in claim 1, wherein each channel circuit comprises, in series: a near variable delay line, a near tap block, a far variable delay line, and a far tap block.

11.   A cancellation system as claimed in claim 1, wherein each variable delay

25   line comprises cascaded register blocks linked by multiplexers comprising means for bypassing a register block or feeding data through it according to training control signals setting a delay length.

12.   A cancellation system as claimed in claim 1, wherein the training means

30   comprises an adaptation module for at least one tap block.

13. A cancellation system as claimed in claim 12, wherein at least some adaptation modules comprise means for training two or more tap blocks.

5 14. A cancellation system for echo or crosstalk noise in a communication transceiver for a plurality of channels, the system comprising a channel circuit comprising taps for each channel and means for training the taps by setting coefficient values, characterised in that:-

10 at least some of the channel circuits (11(a) – 11(d)) each comprise insufficient taps for a full span;

each of said channel circuits further comprises a variable delay line (vdl) connected in series with the taps;

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the training means comprises means for sharing taps from another channel circuit when training each channel circuit in order to achieve a full span for each channel during training; and

20 the training means comprises means for determining an optimum position for each tap block to set the length of the variable delay line, said means comprising means for determining a coefficient sum for each of a plurality of candidate windows, and choosing the window providing the maximum coefficient sum.